Serial Communication Protocol

PRELIMINARY

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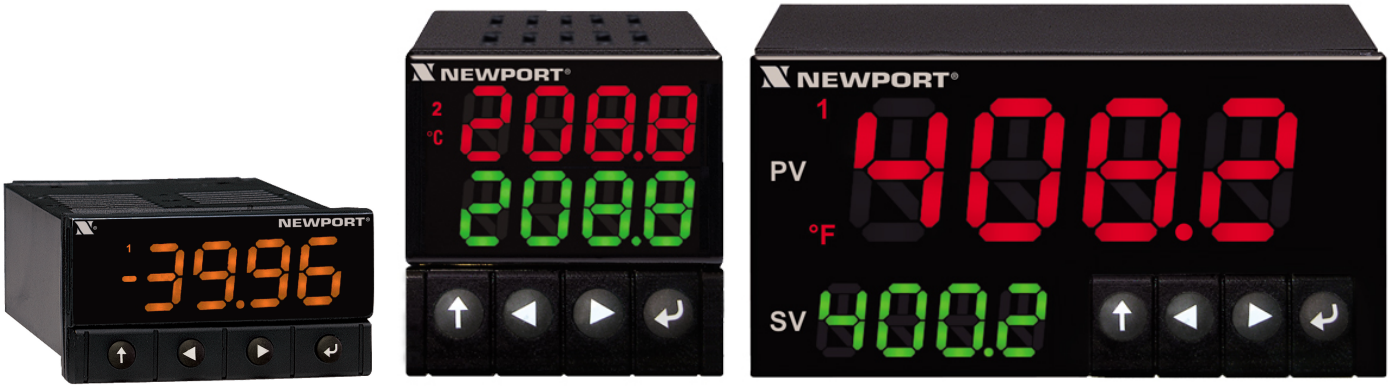

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⚠ This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as it contains important information relating to safety and EMC.

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Table of Contents

1 Introduction

1.1 Purpose

The following document defines the use of the Platinum Series Serial Communications Protocol.

1.2 Definition of Terms and Acronyms

Sensor Element	One of the physical sensing elements on a Smart Output
AC	Alternating Current
DC	Direct Current
CS	Chip Select
ADC	Analog to Digital Converter
DAC	Digital to Analog Converter
RS485	Electrical signals used for serial communications
RS232	Electrical signals used for serial communications
CSV	Comma Separated Values
COTS	Commercially-Off-The-Shelf
ESD	Electo Static Discharge
FW	Firmware
HW	Hardware
I/O	Input/Output
LED	Light Emitting Diode
Hexadecimal	Values expressed using base 16 (2^4)

1.3 Applicable Documents

Doc. #	Name / Description	Rev. #
	Omega Engineering Coding Standard	Rev 1.2.0

2 Hardware

2.1 Communications Interfaces

The Platinum Series Protocol is designed to be an updated version of the original iSeries protocol which can be used over serial connections using RS-232, RS-485, USB and serial over Ethernet.

2.1.1 RS-232

This is for point to point connections at baud rates up to 115,200.

Hardware flow control is not supported.

2.1.2 RS-485

This can be used for multi-point connections. Up to 200 individual addresses can be assigned.

2.1.3 USB Virtual Comm

This is used for point to point connections the same as RS-232.

2.1.4 Ethernet

The serial protocol is transmitted using TCP/IP on port 2000.

3 Protocol Description

3.1 Protocol

The protocol is command/response, based on 4 command classes:

Get (G), Put (P), Read (R) and Write (W). A Get is used to read the current value resident in RAM, a Put is used to write a parameter to RAM without committing it to non-volatile memory. A Read is used to retrieve the value of a parameter stored in non-volatile memory and a write is used to commit a parameter value to non-volatile memory.

3.2 Command Structure

The overall structure of a command packet is as follows:

- A start of frame (SOF) character – usually '*'
- A command class (GPRW)
- A command ID – a hex number identifying the message.
- A mandatory space if there are parameters following the command ID.
- A parameter List.
- An end of frame (EOF) character – usually a carriage return.

A unit address is optional.

An address is a hex-encoded number in the range 0-199 (00 – C7 hex) between the start of frame and the command class.

For example, to get the current process value, without an address would be:

"*G110 <CR>"

In this case the command class is 'G', the command ID is 110 (hex) and this command takes no parameters.

If this were addressed to unit 100 (hex value 64), the command would be:

"*64G110 <CR>"

3.3 Response Format

The response format depends on whether a command echo has been selected. If selected, the address (if present), command class and command ID precede the parameters returned.

For example, if an echo is selected, the previous command would return:

"G110+32.0<CR>" (no address)

"64G110+32.0<CR> (if the unit responding had address = 64 (hex).

If echo is not selected, in both cases, only "+32.0<CR>" would be returned.

For put (P) and Write (W) type transactions, only the command is echoed if echo is on. Thus,

"*Pxxx yyyyyy<CR>" will echo "Pxxx<CR>".

3.4 Error Messages

In the event of an error in the message format, an error string is returned:

"Command Failed Decode 0"

4 Platinum Series Messages

4.1 Input Configuration

Input Configuration									
ID	**Classes**	Parameters							
0x100	GPRW	STYPE	SI1	SI2					

The parameters are as follows:

STYPE - Sensor Type	
Value	**Type**
0	Thermocouple
1	RTD
2	Process Input
3	Thermistor
4	Remote

The meaning of the two sensor info fields, SI1 and SI2 depends on the sensor type indicated in the STYPE field.

For thermocouple type (STYPE = 0)

SI1 – Sensor Info 1 Thermocouple Type)	
Value	**Type**
0	J
1	K
2	T
3	E
4	N
5	Reserved
6	R

7	S
8	B
9	C
10	Reserved
11	Reserved

For thermocouple, the SI2 field is irrelevant.

Example: to set input type to Type K thermocouple: “*W100 010<CR>”

For RTD Sensor type (STYPE = 1)

SI1 – Sensor Info 1 RTD Configuration	
Value	**Type**
0	2 Wire
1	3 Wire
2	4 Wire

SI2 – Sensor Info 1 RTD ACRV Ohm Types	
Value	**Type**
0	385 Curve, 100 ohms
1	385 Curve, 500 ohms
2	385 Curve, 1000 ohms
3	392 Curve, 100 ohms
4	3916Curve, 100 ohms

For Process Input (STYPE = 2)

SI1 – Process Range	
Value	**Range**
0	4 – 20 mA
1	0 – 24 mA
2	*NS
3	*NS
2	*NS
5	+/– 10 Vdc
6	+/ – 1.0 Vdc
7	+/ – 0.1 Vdc

*NS – Not currently supported.

SI2 – Sensor Info 2 Process Manual/Live	
0	Live
1	Manual

For Thermistor Type (STYPE = 3)

SE1 – Sensor Info 1 - Thermistor Type	
0	2.25 K
1	5K
2	10K

The Sensor Info 2 Field is irrelevant when STYPE = 3

For Remote Sensor Type (STYPE = 4)

This is not currently supported and is for future expansion.

4.2 Filter Constant

Filter Constant									
ID	**Classes**	Parameters							
0x101	GPRW	FC							

The parameters are as follows:

FC	
Value	**Effect**
0	No filtering (1 X rate)
1	X 2 filtering
2	X 4 filtering
3	X 8 filtering
4	X 16 filtering
5	X 32 filtering
6	X 64 filtering
7	X 128 filtering

Example: To set input filter to x2 “*W101 1<CR>”

4.3 Current Reading

Current Reading									
ID	**Classes**	**Parameters**							
0x110	G								

This does not take any parameters.

Example: To get current process reading: “*G110<CR>”

4.4 Peak Reading

Peak Reading									
ID	**Classes**	**Parameters**							
0x111	G								

This command does not take any parameters.

4.5 Valley Reading

Valley Reading									
ID	**Classes**	**Parameters**							
0x112	G								

This command does not take any parameters.

4.6 TC Calibration Type

TC Calibration Type									
ID	**Classes**	**Parameters**							
0x120	GPRW	Mode							

The parameters are as follows:

Mode	
Value	**Effect**
0	No Calibration
1	1 Point
2	2 Point
3	Ice Point

4.7 TC Calibration Single Point

TC Calibration Single Point		
ID	**Classes**	**Parameters**
0x121	GPRW	Value (float)

4.8 TC Calibration Double Point Low

TC Calibration Double Point Low		
ID	**Classes**	**Parameters**
0x122	GPRW	Value (float)

4.9 TC Calibration Double Point High

TC Calibration Double Point High		
ID	**Classes**	**Parameters**
0x123	GPRW	Value (float)

4.10 Process Reading 1 (Low)

Process Reading 1 (Low)				
ID	**Classes**	**Parameters**		
0x130	GPRW	PR	ML	Value (float)

PR – Process Range	
Value	**Range**
0	4 – 20 mA

1	0 – 24 mA
2	*NS
3	*NS
4	*NS
5	+/– 10 Vdc
6	+/ – 1.0 Vdc
7	+/ – 0.1 Vdc

ML – Manual/Live	
Value	**Range**
0	Manual Mode
1	Live Mode

*NS – not currently supported.

4.11 Process Range Input 1 (Low)

Process Range Input - Low				
ID	**Classes**	**Parameters**		
0x131	GPRW	PR	ML	Value (float)

The parameters PR and ML, are the same as defined for command ID = 0x130.

4.12 Process Range Reading 2 (High)

Process Range Reading (High)				
ID	**Classes**	**Parameters**		
0x132	GPRW	PR	ML	Value (float)

The parameters PR and ML, are the same as defined for command ID = 0x130.

4.13 Process Range Input 2 (High)

Process Range Input - High				
ID	**Classes**	**Parameters**		
0x133	GPRW	PR	ML	Value (float)

The parameters PR and ML, are the same as defined for command ID = 0x130.

4.14 Display Configuration

Display Configuration									
ID	**Classes**	**Parameters**							
0x200	GPRW	DP	UNIT	COLOR	BRT				

The parameters are as follows:

DP - Decimal Point	
Value	**Effect**
0	Display as F.FFF
1	Display as FF.FF

Units	
Value	**Effect**
0	No units applied
1	Values converted to oC
2	Values converted to oF

Color	
Value	**Effect**
1	GREEN
2	RED
3	AMBER

BRT - Brightness	
Value	**Brightness**
0	LOW
1	MEDIUM
2	HIGH

4.15 Excitation Voltage

Excitation Voltage									
ID	**Classes**	**Parameters**							
0x210	GPRW	EV							

The parameters are as follows:

EV – Excitation Voltage

Value	Voltage
0	0 Volts
1	5 Volts
2	10 Volts
3	12 Volts
4	24 Volts

4.16 Safety Configuration

Safety Configuration									
ID	**Classes**	**Parameters**							
0x220	GPRW	POR	OR	LBE					

The parameters are as follows:

POR – Power On Run	
Value	**Voltage**
0	Go to standby when powered on
1	Go to run when powered on

OR – Operate Run	
Value	**Voltage**
0	Disabled
1	Enabled

LBE - Loop Break Enabled	
Value	**Enabled/Disabled**

0	Disabled
1	Enabled

4.17 Loop Break Configuration

Loop Break Configuration									
ID	**Classes**	**Parameters**							
0x221	GPRW	LBE	MINMS	MINLS	SECMS	SECLS			

LBE - Loop Break Enabled	
Value	**Enabled/Disabled**
0	Disabled
1	Enabled

The parameters MINMS, MINLS define the minutes in the loop break time. MINMS is the most significant part of the minutes, MINLS the least significant. Both are in hex format.

For example, to encode 100 minutes, MINMS = 6, MINLS = 4. (64 hex).

The second's portion of the loop break time is similarly defined in SECMS, SECLS.

4.18 Set Point Low Limit

Set Point Low Limit		
ID	**Classes**	**Parameters**
0x222	GPRW	Value (float)

4.19 Set Point High Limit

Set Point High Limit		
ID	**Classes**	**Parameters**

0x223	GPRW	Value (float)

4.20 Serial Communication Address

Serial Communications Address									
ID	**Classes**	**Parameters**							
0x300	GPRW	AMS	ALS						

The parameters are as follows:

AMS and ALS are the most significant and least significant nibble of the serial communications address in hex format. The address must be in the range 0 to 199 (decimal).

For example, if an address of 100 (decimal) is to be used, the hex value of the address would be 0x64 so AMs would be ‘6’ and ALS would be ‘4’.

4.21 USB Communication Address

USB Communications Address									
ID	**Classes**	**Parameters**							
0x301	GPRW	AMS	ALS						

The format and parameter usage is the same as for the serial communications address.

4.22 Ethernet Communication Address

Ethernet Communications Address									
ID	**Classes**	**Parameters**							
0x302	GPRW	AMS	ALS						

The format and parameter usage is the same as for the serial communications address.

4.23 Serial Communication Config

Serial Communications Configuration									
ID	**Classes**	**Parameters**							
0x310	GPRW	PROT	DM	LFE	ECHO	SEP			

The parameters are as follows:

PROT- Protocol	
Value	**Protocol**
0	Omega Protocol
1	Modbus Protocol

Data Mode – Data Mode	
Value	**Voltage**
0	Command
1	Continuous

LFE – Line Feed Enabled	
Value	**Voltage**
0	Don’t insert line feed on responses
1	Insert line feed

ECHO – Response Echo Enabled	
Value	**Voltage**
0	No echo.

1	Echo command in response

SEP - Separation Character (Omega Protocol)	
Value	**Effect**
0	Use <space> character between records
1	Use <CR> between records

The Serial Communications Configuration must be set before the Serial Data Mode (ID = 0x311)

4.24 Serial Data Mode Config

Serial Communications Data Mode Config			
ID	**Classes**	**Parameters**	
0x311	GPRW	MODE	Interval - seconds (variable length - float)

MODE – (Omega Protocol)	
0	Interactive command mode
1	Continuous mode

Serial Modbus Mode Config

The interval is specified as a floating point number in seconds when the continuous mode is specified.

Example: setting serial to continuous mode with 5 second interval:

“*P311 1 5.0<CR>”

4.25 Serial Modbus Mode

Serial Modbus Mode		
ID	**Classes**	**Parameters**

0x314	GPRW	MODE	

MODE - Modbus	
Value	**Mode**
0	RTU
1	ASCII

4.26 Serial Data Format

Serial Data Format									
ID	**Classes**	**Parameters**							
0x312	GPRW	AS	RE	PE	VE	UE			

AS – Alarm Status Enabled in Continuous Mode	
Value	**Voltage**
0	Don’t send alarm status in cont. mode
1	Send alarm status

RE – Readings Enabled in Continuous Mode	
Value	**Voltage**
0	Don’t send readings in cont. mode
1	Send readings

PE – Peak Readings Enabled in Continuous Mode	
Value	**Voltage**
0	Don’t send peak readings in cont. mode
1	Send peak readings

VE – Valley Readings Enabled in Continuous Mode	
Value	**Voltage**
0	Don’t send valley readings in cont. mode
1	Send valley readings

UE – Valley Readings Enabled in Continuous Mode	
Value	**Voltage**
0	Don’t append measurement units in cont. mode
1	Append measurement units in cont. mode.

4.27 Serial Communications Parameters

Serial Communications Parameters									
ID	**Classes**	**Parameters**							
0x313	GPRW	MODE	BR	PAR	DB	SB			

MODE - Serial Mode	
Value	**Mode**
0	RS232
1	RS485

BR - Serial Baud Rate	
Value	**Rate**
0	300 Baud
1	600 Baud
2	1200 Baud

3	2400 Baud
4	4800 Baud
5	9600 Baud
6	19200 Baud
7	38400 Baud
8	57600 Baud
9	115200 Baud

PAR - Parity	
Value	**Parity**
0	None
1	Odd
2	Even

DB - Data Bits	
Value	**Bits**
0	7
1	8

SB - Stop Bits	
Value	**Bits**
0	1
1	2

4.28 USB Communications Configuration

USB Communications Configuration									
ID	**Classes**	**Parameters**							
0x320	GPRW	PROT	DM	LFE	ECHO	SEP			

This is for use with a virtual com serial port. The usage of the parameters is the same as for the Serial Communications Message.

4.29 USB Data Mode Configuration

USB Communications Data Mode Config			
ID	**Classes**	**Parameters**	
0x321	GPRW	MODE	Interval - seconds (float)

The usage of the parameters for this command is the same as for the Serial Communications Data Mode (ID = 0x311)

4.30 USB Modbus Mode

USB Modbus Mode			
ID	**Classes**	**Parameters**	
0x323	GPRW	MODE	

MODE - Modbus	
0	RTU
1	ASCII

4.31 USB Data Format

Serial Data Format									
ID	**Classes**	**Parameters**							
0x312	GPRW	AS	RE	PE	VE	UE			

The usage of the parameters for this command is the same as for the Serial Data Format (ID = 0x312).

4.32 Ethernet Communications Configuration

Ethernet Communications Configuration									
ID	**Classes**	**Parameters**							
0x330	GPRW	PROT	DM	LFE	ECHO	SEP			

The usage of the parameters for this command is the same as for the Serial Communications Configuration (ID = 0x310).

4.33 Ethernet Data Mode Configuration

Ethernet Communications Data Mode Config			
ID	**Classes**	**Parameters**	
0x331	GPRW	MODE	Interval - seconds (float)

The usage of the parameters for this command is the same as for the Serial Communications Data Mode (ID = 0x311).

4.34 Ethernet Data Format

Ethernet Data Format									
ID	**Classes**	**Parameters**							
0x332	GPRW	AS	RE	PE	VE	UE			

The usage of the parameters for this command is the same as for the Serial Data Format command (ID = 0x312).

4.35 Ethernet Modbus Mode

Ethernet Modbus Mode		
ID	**Classes**	**Parameters**

0x333	GPRW	MODE	

MODE - Modbus	
0	RTU
1	ASCII

4.36 Setpoint 1

Setpoint 1		
ID	**Classes**	**Parameters**
0x400	GPRW	Setpoint Value - variable length (float)

4.37 Remote Setpoint Configuration

Remote Setpoint Configuration									
ID	**Classes**	**Parameters**							
0x401	GPRW	EN	PR						

EN – Enable Remote Setpoint	
Value	**Action**
0	Enable Remote Setpoint
1	Disable Remote Setpoint

PR - Output Process Range	
Value	Range
0	4 - 20 V
1	0 – 24 V
2	0 – 10 V

3	0 – 1 V

4.38 Setpoint 2

Setpoint 2			
ID	**Classes**	**Parameters**	
0x410	GPRW	TYPE	Setpoint Value - variable length (float)

TYPE - Setpoint Type	
Value	**Action**
0	Setpoint value given as fixed constant
1	Setpoint value is deviation (+/-) Setpoint 1 value

4.39 Remote Process Range Setpoint Min

Remote Process Range Setpoint Minimum			
ID	**Classes**	**Parameters**	
0x420	GPRW	PR	Setpoint Value (float – variable length)

The parameters are as follows:

PR - Output Process Range

Value	Range
0	4 - 20 V
1	0 – 24 V
2	0 – 10 V
3	0 – 1 V

4.40 Remote Process Range Setpoint Max

Remote Process Range Setpoint Maximum			
ID	**Classes**	**Parameters**	
0x422	GPRW	PR	Setpoint Value (float – variable length)

The process range parameter PR is as defined for the Remote Process Range Setpoint Min command (ID = 0x420).

4.41 Remote Process Range Input Max

Remote Process Range Input Maximum			
ID	**Classes**	**Parameters**	
0x423	GPRW	PR	Setpoint Value (float – variable length)

The process range parameter PR is as defined for the Remote Process Range Setpoint Min command (ID = 0x420).

4.42 Remote Process Range Input Min

Remote Process Range Input Minimum			
ID	**Classes**	**Parameters**	
0x421	GPRW	PR	Setpoint Value (float – variable length)

The process range parameter PR is as defined for the Remote Process Range Setpoint Min command (ID = 0x420).

4.43 PID Configuration

PID Configuration									
ID	**Classes**	**Parameters**							
0x500	GPRW	CA	AC						

CA - Control Action	
Value	**Action**
0	Output active if P.V. < Setpoint
1	Output active if P.V. > Setpoint

AC – Adaptive Control	
Value	**Action**
0	Enable Adaptive Control
1	Disable Adaptive Control

4.44 PID Low Clamping Limit

PID Low Clamping Limit									
ID	**Classes**	**Parameters**							
0x501	GPRW	CLMS	CLLS						

The hex-encoded byte fields CLMS, CLLS form the hex representation of the limit (percent) 0-100

For example, if the limit were to be 35 (decimal) the hex representation would be 23, so CLMS would equal 2 and CLLS 3.

4.45 PID High Clamping Limit

PID High Clamping Limit									
ID	**Classes**	**Parameters**							
0x502	GPRW	CLMS	CLLS						

The encoding of the high clamping limit is the same as for the low clamping limit.

4.46 PID P Parameter

PID P-Parameter		
ID	**Classes**	**Parameters**
0x503	GPRW	P-parameter Value (float – variable length)

4.47 PID I Parameter

PID I-Parameter		
ID	**Classes**	**Parameters**
0x504	GPRW	I-parameter Value (float – variable length)

4.48 PID D Parameter

PID D-Parameter		
ID	**Classes**	**Parameters**
0x505	GPRW	D-parameter Value (float – variable length)

4.49 Output Mode

Output Mode									
ID	**Classes**	**Parameters**							
0x600	GPRW	NOUT	MODE						

NOUT – the output number (1-4)

MODE - Output Mode	
Value	**Mode**
0	Output maintained in OFF state
1	Output control by PID control function
2	Output controlled by ON-OFF control function
3	Output retransmits the scaled process variable
4	Output set by ALARM 1 state
5	Output set by ALARM 2 state
6	Output set by Ramp & Soak RE.ON control bit
7	Output set by Ramp & Soak SE.ON control bit

4.50 Output Type

Output Type									
ID	**Classes**	**Parameters**							
0x601	G	NOUT							

NOUT – the output number

This returns the output type for the specified output as a hex encoded string as follows:

Output Types	
Code Returned (hex encoded)	**Type**
000	No output available
001	Single Poll Relay
002	SSR output
004	Double Poll Relay
008	DC Pulse output
010	Analog Output
020	Isolated Analog Output

4.51 Output ON/OFF Configuration

Output On/Off Config				
ID	**Classes**	**Parameters**		
0x610	GPRW	NOUT	RD	Dead Band Value (float – variable length)

NOUT is the output number (1-4)

RD – Reverse/Direct	
Value	**Action**
0	Reverse
1	Direct

4.52 Output Alarm Configuration

Output Alarm Configuration		
ID	**Classes**	**Parameters**

0x620	G	NAL	TYP	MODE	COLOR	HHEN	LAT	CNT	PO

NAL is the alarm number (1-2)

TYP- Alarm Type	
0	Alarm not active
1	Alarm triggered if PV > ALM.H
2	Alarm trigger if PV < ALM.L
3	Alarm trigger if PV > ALM.H or PV < ALM.L
4	Alarm trigger if PV > ALM.L and PV < ALM.H

MODE - Alarm Mode	
Value	**Mode**
0	Alarm setpoint is fixed constant
1	Alarm is offset from Setpoint 1
2	Alarm is offset from Setpoint 2

Color	
Value	**Alarm Color**
0	No color
1	GREEN
2	RED
3	AMBER

HHEN – HiHi Mode	
Value	**Action**
0	Enable Hi Hi Mode
1	Disable Hi Hi Mode

LAT- Alarm Latch Control	
Value	**Action**
0	Alarm does not latch
1	Alarm state will be latched, clear by front panel
2	Alarm state will be latched, clear by digital input
3	Alarm state latched, clear by front panel or input

CNT – Contact Polarity	
Value	**Polarity**
0	Contacts OPEN until activated
1	Contacts CLOSED until activated

PO – Power On Enable	
0	Not active on power-on
1	Active on power-on

4.53 Hi Value

Alarm Hi Value			
ID	**Classes**	**Parameters**	
0x621	GPRW	NAL	Hi Value (float – variable length)

NAL = alarm number (1-2)

4.54 Low Value

Alarm Low Value			
ID	**Classes**	**Parameters**	
0x622	GPRW	NAL	Low Value (float – variable length)

4.55 On Delay

Alarm On Delay			
ID	**Classes**	**Parameters**	
0x623	GPRW	NAL	On Delay - seconds (float – variable length)

NAL = alarm number (1 – 2)

4.56 Off Delay

Alarm Off Delay			
ID	**Classes**	**Parameters**	
0x624	GPRW	NAL	Off Delay - seconds (float – variable length)

NAL – alarm number (1-2)

4.57 HiHi Mode

HiHi Mode									
ID	**Classes**	**Parameters**							
0x625	GPRW	NAL	ON/OFF						

NAL – alarm number

ON/OFF	
0	On
1	Off

4.58 HiHi Offset

Alarm HiHi Offset			
ID	**Classes**	**Parameters**	
0x626	GPRW	NAL	Offset (float – variable length)

4.59 Output Retransmission Reading 1

Output Retransmission Reading 1			
ID	**Classes**	**Parameters**	
0x630	GPRW	NOUT	Reading Value (float – variable length)

NOUT – output number (1-4)

4.60 Output Retransmission Output 1

Output Retransmission Output 1			
ID	**Classes**	**Parameters**	
0x631	GPRW	NOUT	Output Value (float – variable length)

NOUT – output number (1-4)

4.61 Output Retransmission Reading 2

Output Retransmission Reading 2			
ID	**Classes**	**Parameters**	
0x632	GPRW	NOUT	Reading Value (float – variable length)

NOUT = output number (1-4)

4.62 Output Retransmission Output 2

Output Retransmission Output 2			
ID	**Classes**	**Parameters**	
0x633	GPRW	NOUT	Output Value (float – variable length)

NOUT – output number (1-4)

4.63 Output Cycle Time/Pulse Width

Output Cycle Time/Pulse Width			
ID	**Classes**	**Parameters**	
0x650	GPRW	NOUT	Cycle Time - seconds (float – variable length)

NOUT – output number

4.64 Output Range

Output Range									
ID	**Classes**	**Parameters**							
0x660	GPRW	NOUT	RANGE						

RANGE	
Value	**Range**
0	0 – 10V
1	0 – 5V
2	0-20V
3	4-20V
4	0-24V

4.65 Time Format

Time Format									
ID	**Classes**	**Parameters**							
0x700	GPRW	FMT							

FMT - Time Format	
0	MM.SS displayed
1	HH.MM displayed
2	S.MMM displayed

4.66 Multi Ramp/Soak Configuration

Ramp/Soak Config									
ID	**Classes**	**Parameters**							
0x720	GPRW	RS							

RS – Ramp Soak Mode	
0	Ramp/Soak Disabled
1	Ramp/Soak Enabled
2	Ramp/Soak Remote Control

4.67 Multi Ramp/Soak Profile Configuration

Multi Ramp/Soak Profile Config									
ID	**Classes**	**Parameters**							
0x721	RW	PMS	PLS	SC	TE				

PMS, PLS form the profile number in hex form. PMS is the most significant hex digit, PLS the least significant. For example, segment 31 (0x1f) would be encoded as PMS = ‘1’, PLS = ‘F’

SC is the segment count (0 – 15) encoded as a single hex digit.

TE- Tracking Enabled	
0	Disabled
1	Enabled

4.68 Multi Ramp/Soak Segment Event Configuration

Multi Ramp/Soak Event Config									
ID	**Classes**	**Parameters**							
0x730	RW	NSEG	RE	SE					

PMS, PLS identify the profile number as in Multi Ramp/Soak Profile Configuration (ID = 0x721).

NSEG is the segment number encoded as a single hex digit (0-F)

RE – Ramp enabled (1) or disabled (0) for segment

SE – Soak enabled (1) or disabled (0) for segment.

4.69 Multi Ramp/Soak Profile Segment Ramp Time

Multi Ramp/Soak Segment Ramp Time			
ID	**Classes**	**Parameters**	
0x731	RW	NSEG	Ramp Time Seconds (float, variable length)

NSEG is a single hex digit identifying the segment number

4.70 Multi Ramp/Soak Profile Segment Soak Process Value

Multi Ramp/Soak Segment Soak Process Value

ID	Classes	Parameters	
0x732	RW	NSEG	Soak Value (float, variable length)

NSEG is a single hex digit identifying the segment number

4.71 Multi Ramp/Soak Profile Segment Soak Time

Multi Ramp/Soak Segment Soak Time			
ID	**Classes**	**Parameters**	
0x733	RW	NSEG	Soak Time - seconds (float, variable length)

PMS, PLS pair identify the profile number as in the Multi-Ramp Profile Config message (ID = 0x721)
NSEG is a single hex digit identifying the segment number

4.72 INIT Password

INIT Password									
ID	**Classes**	**Parameters**							
0xF00	GPRW	EN	PWD3	PWD2	PWD1	PWD0			

EN – Enable Init (1) / Disable Init (0)
The parameters PWD0-3 form a hex encoded number. The range of each must be 0-9. For example, '1234' would be encoded as PWD3 = 1, PWD2 = 2, PWD1 = 3, PWD0 = 4

4.73 Program Password

Program Password									
ID	**Classes**	**Parameters**							
0xF01	GPRW	EN	PWD3	PWD2	PWD1	PWD0			

EN – Enable Programming (1) / Disable Programming (0)

The parameters PWD0-3 form a hex encoded number. The range of each must be 0-9.

4.74 Version Number

Version Number									
ID	**Classes**	**Parameters**							
0xF20	G								

This command returns the current firmware version number as a hex encoded string. The format is:

- Major (2 bytes)
- Minor (2 bytes)
- Fix (2 bytes)
- Build (2 bytes)

Example: If the current version is 01.00.05.00 the command “*GF20<CR>” would return “01000500”

4.75 Version Upgrade

Version Upgrade									
ID	**Classes**	**Parameters**							
0xF21	P	SEL							

This command forces a firmware upgrade, followed by a reboot.

The SEL parameter determines the method to be used.

SEL – Firmware Upgrade Method	
1	EIP Serial Port
2	User Serial Port
3	USB Thumb drive.

Example: to upgrade using the USB Thumb drive the drive would be inserted into the USB port, followed by the serial command “*PF21 3<CR>”

4.76 Bootloader Version

Bootloader Version Number									
ID	**Classes**	**Parameters**							
0xF22	G								

This retrieves the bootloader version number in exactly the same manner as the version number command (ID = 0xF20).

4.77 Set Factory Defaults

Bootloader Version Number									
ID	**Classes**	**Parameters**							
0xF30	P	EN							

To reset factory defaults, use the command “*PF30 1<CR>”

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